IS01

NASA Enterprise Applications Competency Center (NEACC)

NEACC 508 Compliance Assurance

Policy & Approach

Developing and Testing Applications for User Accessibility

BASELINE

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1   INTRODUCTION

1.1   Purpose

This policy and approach document is for the National Aeronautics and Space Administration (NASA) Enterprise Application Competency Center (NEACC). This compliance assurance strategy provides the standards for development and testing activities utilized for all custom-developed and vendor-provided applications supported by the NEACC.

1.2   Applicability

This document applies to all NEACC application development teams. The intended audience for this document is all NEACC staff.

1.3   Applicable Documents

The following documents referenced below are required to accomplish the purpose of this document:

- Section 508 Amendment to the Rehabilitation Act of 1973, https://www.section508.gov/
- Electronic and Information Technology Accessibility Standards (Section 508), http://www.access-board.gov/sec508/standards.htm.
- Americans with Disabilities Act, http://www.ada.gov/
- NEACC List of Best Practices

1.4   Reference Documents

The following documents are referenced with this document and provide supplemental information:

- Clinger-Cohen Act of 1996, http://www.whitehouse.gov/omb/memoranda_m96-20

1.5   Definitions

The following definitions provide supplemental information for this document:

Table 1. Definitions

Term	Definitions
508 Compliance	In 1998 the US Congress amended the Rehabilitation Act to require Federal agencies to make their electronic and information technology accessible to people with disabilities. Section 508 was enacted to eliminate barriers in information technology, to make available new opportunities for people with disabilities, and to encourage development

Term	Definitions
	of technologies that will help achieve these goals. The law applies to all Federal agencies when they develop, procure, maintain, or use electronic and information technology. Under Section 508 (29 U.S.C. § 794d), agencies must give disabled employees and members of the public access to information that is comparable to the access available to others.

1.6   Acronyms/Abbreviations

The following table defines the acronyms used within this document:

Table 2. Acronyms/Abbreviations

Acronym / Abbreviation	Description
ADA	Americans with Disabilities Act
ALDS	Agency Labor Distribution System
ARIA	Accessible Rich Internet Applications
ARM	Active Risk Manager
BI	Business Intelligence
CITA	Center for IT Accommodation
COTS	Commercial-off-the-shelf
DSPL	Disposal System
EAST	Enterprise Applications Service Technologies
EPDW	Enhanced Procurement Data Warehouse
ERP	Enterprise Resource Planning
ESB	Enterprise Service Bus
GSA	General Services Administration
HCW	Human Capital Workforce
HP	Hewlett Packard
HR	Human Resource
HTML	Hypertext Markup Language
ICAM	Identity, Credential and Access Management
IT	Information Technology
JAWS	Job Access With Speech
LOB	Line of Business
NAIS	NASA Acquisition Internet System
NASA	National Aeronautics and Space Administration
NEACC	NASA Enterprise Application Competency Center

Acronym / Abbreviation	Description
N-Prop	NASA Property Management System
NSS	NEACC Support Systems
OE	Office of Education
OEPM	Office of Education Performance Measurement
OSCAR	Online Supply Catalog and Reservation
OSSI	One-Stop Shopping Initiative
PDF	Portable Document Format
PKI	Public Key Infrastructure
PLM	Product Lifecycle Management
PRISM	Program Information Systems Mission
QA	Quality Assurance
QC	Quality Center
SAP MM	SAP Material Management
SAP PM	SAP Property Management
StaRS	Staffing & Recruiting Systems
URL	Universal Resource Locator
USAB	US Access Board
WAT	Web Accessibility Tool
WAVE	Web Accessibility Versatile Evaluator
WebTADs	Web Time and Attendance Distribution System

2   NEACC Accessibility and Compliance Assurance Policy

Application accessibility holds an important place in the NEACC's development and quality assurance processes. The NEACC will ensure that custom-developed and certain Commercial-off-the-shelf (COTS) configured applications meet Section 508 requirements when feasible to do so without loss of functionality or undue burden. NEACC's goal is two-fold:

1) Develop and provide fully accessible applications for NEACC end-user communities.

2) Achieve full Section 508 compliance for all NEACC custom-developed applications.

NEACC will do this by working with various user communities across the NASA Agency to test applications and provide input throughout development and operations processes.

NEACC realizes there are cases where some applications may have non-compliant functions or capabilities due to technology limitations or user functionality requirements. In these cases, the policy is to formally document and manage the deficiencies and the need for exceptions. In

addition, simply meeting Section 508 compliance does not always imply an application is fully accessible, so the goals reflect the NEACC's need to ensure both compliance and accessibility.

3   Background & Purpose

A key area of software compliance for Federal departments and agencies is the Section 508 Amendment to the Rehabilitation Act of 1973 (aka "Section 508). Section 508 requires that Federal departments and agencies that develop, procure, maintain, and use electronic and information technology (IT) assure that the technologies provide access to information and data for people with disabilities. The US Access Board (USAB) and General Services Administration (GSA) provide technical assistance to the Federal government concerning the Section 508 requirements.

The USAB's responsibilities include developing and maintaining accessibility requirements for electronic and IT, providing technical assistance and training on these guidelines and standards, and enforcing accessibility standards for federally funded facilities. GSA's Office of Government-wide Policy, Center for IT Accommodation (CITA) is charged with educating Federal employees and building the infrastructure to support Section 508 implementation.

4   Scope & Applicability

This document applies to development and testing activities utilized for all custom-developed and vendor-provided applications supported by the NEACC. All 3rd party vendor applications are required to be 508 compliant, although applicable exceptions should be documented. The NEACC 508 Compliance Assurance strategy seeks to address the accessibility needs of users across all user segments while defining the various types of applications NEACC supports.

4.1   NEACC User Segments

NEACC users typically fall into one of three categories: users of NEACC public applications, users of applications utilized only by NASA, and users of applications utilized only by the NEACC. Definitions of each and examples are provided in the list below:

1. **Public Application Users** – Users of applications supported by the NEACC and utilized across the agency and outside NASA. Examples include NASA Acquisition Internet System (NAIS) and people.nasa.gov.
2. **Agency Application Users –** Users of agency applications supported by the NEACC and utilized across the Agency. These applications may be for one Center, multiple Centers,

or all Centers. Examples include SAP, Program Information Systems Mission (PRISM), and Web Time and Attendance Distribution System (WebTADs).

3. **NEACC Application Users** – Users of applications used exclusively to support the NEACC's operations. Examples include Hewlett Packard (HP) Quality Center and Rally.

4.2 NEACC Application Categories

The NEACC provides support of NASA's mission-based and business applications. There are 3 general categories of applications that are supported by the NEACC:

1. **Type 1: Non-customized COTS applications** – applications that are provided by the vendor and not customized by the NEACC. Example includes Approva.
2. **Type 2: Customized COTS applications** – vendor-provided applications that are customized by the NEACC. Examples include SAP, PRISM, and Agency Labor Distribution System (ALDS).
3. **Type 3: Custom-developed applications** – software applications that are custom-developed by the NEACC including open source applications. Examples include Staffing & Recruiting Systems (StaRS), Mobile apps, etc.

Based on the application categories noted above, the following table defines the NEACC's position for Section 508 compliance for each application type.

Table 3. NEACC 508 Compliance by Application Type

Application Type	Action	Accessibility & Compliance Position
Type 1 – Non-customized COTS Applications	No action required	Vendor is responsible for providing statement of compliance and ensuring product is compliant or a waiver has been granted, if applicable.
Type 2 – Customized COTS Applications	Limited action may be required	Vendor is responsible for providing statement of compliance and ensuring product is compliant or a waiver has been granted, if applicable. However, NEACC may "extend" or "configure" user interface components which may have a usability impact. In these cases, the NEACC will follow 508 Compliance Assurance process for development and testing of these applications. NEACC will be responsible for reviewing customizations only and will not seek to test vendor-provided functionality for compliance.

Application Type	Action	Accessibility & Compliance Position
Type 3 – Custom-Developed Applications	Action required	NEACC will ensure accessibility and compliance based on policy and goals stated above.

The guidelines set forth below are only applicable to NEACC Type 3 applications. The USAB maintains all standards referenced in this document at via Electronic and Information Technology Accessibility Standards (Section 508) http://www.access-board.gov/sec508/standards.htm. At present, the NEACC will only be evaluating Section 508 compliance based on Technical Standards 1194.21 (Software Applications and Operating Systems) and 1194.22 (Web-based intranet and internet information and applications).

4.3   Exceptions

A Federal agency does not have to comply with the technology accessibility standards if it would impose an undue burden to do so. This is consistent with language used in the Americans with Disabilities Act (ADA) (http://www.ada.gov/) and other civil rights legislation, where the term `undue burden' has been defined as "significant difficulty or expense." However, the agency must explain why meeting the standards would pose an undue burden for a given procurement action, and must still provide people with disabilities access to the information or data that is affected.

Section 508 contains a limited exemption for national security systems as defined by the Clinger-Cohen Act of 1996 (http://www.whitehouse.gov/omb/memoranda_m96-20). These are systems used for military command, weaponry, intelligence, and cryptology activities. The exemption does not apply to routine business and administrative systems used for other defense-related purposes or by defense agencies or personnel.

5   Section 508 Compliance Development Guidelines

This section contains the application development guidelines that will be followed when any development activity is conducted at the NEACC. It is expected that all development and testing team members fully understand requirements in the tables contained in section 5.2 and 5.3, as these requirements were derived from the USAB's Electronic and Information Technology Accessibility Standards 1194.21 (Software Applications and Operating Systems) and 1194.22 (Web-Based Intranet and Internet Information and Applications) technical standards. Other technical standards defined in section 1194 (e.g., 1194.23, 1194.24, 1194.31, etc.) are not applicable to the NEACC's 508 Compliance Assurance process due to the scope of each of these subsections.

In all cases, NEACC development team members must ensure that each standard below has been considered and addressed when designing, developing, and implementing applications. In

addition, developers are expected to refer to the NEACC list of defined best practices as described on the bReady portal at ███████████████████████ ███████████████████████

5.1 Technology Applicability for Section 508 Compliance

NEACC applications can be classified across six primary technology domains: Enterprise Resource Planning (ERP), Business Intelligence (BI), Web Development, Mobile Development, Client-Server, and Infrastructure. All of the NEACC's supported applications will reside under one of these technology domains. The table below identifies each of these domains, representative NEACC applications, and associated testing tools required for each. This table seeks to identify all NEACC technologies, platforms, and programming languages that may impact accessibility and/or Section 508 compliance. The NEACC updates the information frequently as new technologies are added or removed from use or support.

Table 4. NEACC Technologies, Platforms and Programming Languages

Line of Business (LOB)	Technology Domain	Representative Example Applications	508 Testing Tools Required	Impact of Technology Use
BI	ERP	SAP	Will vary depending upon technology. Web Accessibility Versatile Evaluator (WAVE) for Web, manual testing utilizing Job Access With Speech (JAWS) for non-Web	**Type 2** NEACC applications within this domain. NEACC will test customized portions of Type 2 applications only. No NEACC 508 testing required for vendor-delivered (e.g., core) functionality due to vendor 508 compliance responsibility.
	Business Intelligence	Cognos	Will vary depending upon technology. WAVE for Web, manual	**Type 2** NEACC applications within this domain. NEACC will test customized portions of Type 2 applications only. No NEACC 508 testing

Line of Business (LOB)	Technology Domain	Representative Example Applications	508 Testing Tools Required	Impact of Technology Use
			testing utilizing JAWS for non-Web	required for vendor-delivered (e.g., core) functionality due to vendor 508 compliance responsibility.
Enterprise Service Bus (ESB)	Web	Web Accessibility Tool (WAT), ESB, bReady Storefront	WAVE (Required) Total Validator (As Deemed Necessary by LOB)	**Type 1 & 3** NEACC applications within this domain. Technologies for new development work include Java, Hypertext Markup Language (HTML) 5, Perl, Flex. Limited operational support for other technologies' provided (e.g., Cold Fusion for Office of Education (OE)).
	Mobile	Space365, Apps@NASA	Pending	Pending assessment based on infancy of mobile accessibility determinations and tools required.
Financial	ERP	SAP Financial	Will vary depending upon technology. WAVE for Web, manual testing utilizing JAWS for non-Web	**Type 2** NEACC applications within this domain. NEACC will test customized portions of Type 2 applications only. No NEACC 508 testing required for vendor-delivered (e.g., core) functionality due to vendor 508 compliance responsibility.
	Web	MdM	WAVE (Required) Total Validator Pro (As Deemed Necessary by LOB)	**Type 3** NEACC applications within this domain. Technologies for new development work include JAVA, HTML 5, Perl, Flex. Limited operational support for other technologies'

Line of Business (LOB)	Technology Domain	Representative Example Applications	508 Testing Tools Required	Impact of Technology Use
				provided (e.g., Cold Fusion for OE).
Human Capital Workforce (HCW)	Web	ALDS, StaRS, HR Portal, WebTADS,	WAVE (Required) Total Validator Pro (As Deemed Necessary by LOB)	**Type 2 & 3** NEACC applications within this domain. Technologies for new development work include JAVA, HTML 5, Perl, Flex. Limited operational support for other technologies' provided (e.g., Cold Fusion for OE).
	Mobile	WebTADS Mobile	Pending	Pending assessment based on infancy of mobile accessibility determinations and tools required.
Identity, Credential and Access Management (ICAM)	Web	LaunchPad, Card Management System, Public Key Infrastructure (PKI)	WAVE (Required) Total Validator Pro (As Deemed Necessary by LOB)	**Type 1, 2, & 3** NEACC applications within this domain. Technologies for new development work include JAVA, HTML 5, Perl, Flex. Limited operational support for other technologies' provided (e.g., Cold Fusion for OE).
NEACC Support Systems (NSS)	Web	JIRA, HP QualityCenter	N/A	**Type 1 & 2** NEACC applications. As of 2012, NSS applications are out of scope for 508 Compliance Testing.
	Client-Server	Remedy	N/A	**Type 1 & 2** NEACC applications. As of 2012, NSS applications are out of scope for 508 Compliance Testing.
	Infrastructure	Oracle	N/A	**Type 1 & 2** NEACC applications. As of 2012, NSS applications are out of scope for 508 Compliance

Line of Business (LOB)	Technology Domain	Representative Example Applications	508 Testing Tools Required	Impact of Technology Use
				Testing.
OE	Web	Office of Education Performance Measurement (OEPM), One-Stop Shopping Initiative (OSSI)	WAVE (Required) Total Validator Pro (As Deemed Necessary by LOB)	**Type 1, 2, & 3** NEACC applications within this domain. Technologies for new development work include JAVA, HTML 5, Perl, Flex. Limited operational support for other technologies' provided (e.g., Cold Fusion for OE).
Logistics	ERP	SAP Material Management (MM), SAP Property Management (PM)	Will vary depending upon technology. WAVE for Web, manual testing utilizing JAWS for non-Web	**Type 2** NEACC applications within this domain. NEACC will test customized portions of Type 2 applications only. No NEACC 508 testing required for vendor-delivered (e.g., core) functionality due to vendor 508 compliance responsibility.
	Web	NASA Property (N-PROP), Disposal System (DSPL), Online Supply Catalog and Reservation (OSCAR)	WAVE (Required) Total Validator Pro (As Deemed Necessary by LOB)	**Type 1, 2, & 3** NEACC applications within this domain. Technologies for new development work include JAVA, HTML 5, Perl, Flex. Limited operational support for other technologies' provided (e.g., Cold Fusion for OE).
	Mobile	Mobile Inventory (Universal Resource Locator) URL)	Pending	Pending assessment based on infancy of mobile accessibility determinations and tools required.
Product Lifecycle Management	Web	Windchill, Cradle, Active Risk Manager	WAVE (Required) Total Validator	**Type 1, 2, & 3** NEACC applications within this domain. Technologies for

Line of Business (LOB)	Technology Domain	Representative Example Applications	508 Testing Tools Required	Impact of Technology Use
(PLM)		(ARM)	Pro (As Deemed Necessary by LOB)	new development work include JAVA, HTML 5, Perl, Flex. Limited operational support for other technologies' provided (e.g., Cold Fusion for OE).
Procurement	ERP	SAP Purchasing	Will vary depending upon technology. WAVE for Web, manual testing utilizing JAWS for non-Web	**Type 2** NEACC applications within this domain. NEACC will test customized portions of Type 2 applications only. No NEACC 508 testing required for vendor-delivered (e.g., core) functionality due to vendor 508 compliance responsibility.
	Web	CMM/PRISM, NAIS, Enhanced Procurement Data Warehouse (EPDW), Bankcard	WAVE (Required) Total Validator Pro (As Deemed Necessary by LOB)	**Type 1, 2, & 3** NEACC applications within this domain. Technologies for new development work include JAVA, HTML 5, Perl, Flex. Limited operational support for other technologies' provided (e.g., Cold Fusion for OE).

5.2   Guidelines for Technical Standard 1194.21 (Software Applications and Operating Systems)

The standards defined in the table below have been extracted from the USAB's Electronic and Information Technology Accessibility Standards at http://www.access-board.gov/sec508/guide/1194.21.htm.

Table 5. USAB Technical Standard 1194.21

1194.21 Standard	Compliant	Noncompliant

1194.21 Standard	Compliant	Noncompliant
1194.21 (a) Executing Function from Keyboard		
When software is designed to run on a system that has a keyboard, product functions shall be executable from a keyboard where the function itself or the result of performing a function can be discerned textually.	• All functionalities of application can be operated using the keyboard.	• Functionality requires mouse only or mouse keyboard combination.
1194.21 (b) Accessibility Features		
Applications shall not disrupt or disable activated features of other products that are identified as accessibility features, where those features are developed and documented according to industry standards. Applications also shall not disrupt or disable activated features of any operating system that are identified as accessibility features where the application programming interface for those accessibility features has been documented by the manufacturer of the operating system and is available to the product developer.	• Accessibility features that are "built-in" the software cannot be disabled once the application has been started.	• Accessibility features that are "built-in" the software can be disabled once the application has been started .
1194.21 (c) Input Focus		
A well-defined on-screen indication of the current focus shall be provided that moves among interactive interface elements as the input focus changes. The focus shall be programmatically exposed so that assistive technology can track focus and focus changes.	• Assistive technology can track "input focus" and any of the changes to the "input focus"	• Assistive technology cannot track "input focus" and any of the changes to the "input focus" .
1194.21 (d) User Interface Element		

1194.21 Standard	Compliant	Noncompliant
Sufficient information about a user interface element including the identity, operation and state of the element shall be available to assistive technology. When an image represents a program element, the information conveyed by the image must also be available in text.	• When an image represents a program element (i.e. Button checkboxes, menus, toolbars, scroll bars, and any other feature of a program that is intended to allow the user to perform some action.) the information conveyed by the image must also be available in text.	• When an image represents a program element (i.e. Button checkboxes, menus, toolbars, scroll bars, and any other feature of a program that is intended to allow the user to perform some action.) the information conveyed by the image IS NOT available in text.
1194.21 (e) Bitmap Images		
When bitmap images are used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images shall be consistent throughout an application's performance.	• When a .bmp file format is used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images shall be consistent throughout an application's performance.	• When a .bmp file format is used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images IS NOT consistent throughout an application's performance.
1194.21 (f) Textual Information		
Textual information shall be provided through operating system functions for displaying text. The minimum information that shall be made available is text content, text input caret location, and text attributes.	• The text should be written to the screen through the operating system. (text content, text input caret location, and text attributes)	• The text is not available for the screen through the operating system.
1194.21 (g) User Selected Attributes		

1194.21 Standard	Compliant	Noncompliant
Applications shall not override user selected contrast and color selections and other individual display attributes.	• Users can select personalized settings which cannot be disabled by software programs after the application has started. (Includes user selected contrast and color selections and other individual display attributes.)	• Software programs override personalized settings after the application has started. (Includes user selected contrast and color selections and other individual display attributes.)
1194.21 (h) Animation		
When animation is displayed, the information shall be displayable in at least one non-animated presentation mode at the option of the user.	• This provision requires that in addition to the animation, an application shall provide an option to turn off animation	• Animation cannot be turned off.
1194.21 (i) Color Coding		
Color coding shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.	• Some other method of identification for actions on the screen, such as text labels, can be combined with the use of color.	• Color is the only way to identify the actions on the screen.
1194.21 (j) Color and Contrast Settings		
When a product permits a user to adjust color and contrast settings, a variety of color selections capable of producing a range of contrast levels shall be provided.	• The application has a variety of color and contrast settings.	• The available choices does not allow for different levels of contrast.
1194.21 (k) Flashing or Blinking Text		
Software shall not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.	• Software shall not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.	• Software uses flashing or blinking text, objects, or other elements with a flash or blink frequency greater than 2 Hz and lower than 55 Hz.
1194.21 (l) Electronic Forms		

1194.21 Standard	Compliant	Noncompliant
When electronic forms are used, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.	• When electronic forms are used, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.	• When electronic forms are used, the form does not allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.

5.3 Guidelines for Technical Standard 1194.22 (Web-based intranet and internet information and applications)

The standards defined in the table below have been extracted from the USAB's Electronic and Information Technology Accessibility Standards at http://www.access-board.gov/sec508/guide/1194.22.htm.

Table 6. USAB Technical Standard 1194.22

1194.22 Standard	Compliant	Noncompliant
1194.22 (a) Text Tags		

1194.22 Standard	Compliant	Noncompliant
A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).	• Every image, Java applet, Flash file, video file, audio file, plug-in, etc. has an alternate description, transcript, or other textual equivalent. • Complex graphics (graphs, charts, etc.) are accompanied by detailed text descriptions. • The alternate descriptions succinctly describe the *purpose* of the objects, without being too verbose (for simple objects) or too vague (for complex objects). • *Alt* descriptions for images used as links are descriptive of the link destination. • Decorative graphics with no other function have *empty alt* descriptions (alt= ""), but they never have *missing* alt descriptions.	• A non-text element has no alternate textual equivalent. • Complex graphics have no alternative text, or the alternative does not fully convey the meaning of the graphic. • *Alt* descriptions are verbose, vague, misleading, inaccurate or redundant to the context (e.g. the alt text is the same as the text immediately preceding or following it in the document). • *Alt* descriptions for images used as links are not descriptive of the link destination. • Decorative or formatting graphics have *alt* descriptions that say "spacer", "decorative," or other unnecessary wording.
1194.22 (b) Multimedia Presentations		
Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.	• Multimedia files have synchronized captions.	• Multimedia files do not have captions, or captions which are not synchronized.
1194.22 (c) Color		
Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.	• If color is used to convey important information, an alternative indicator is used, such as an asterisk (*) or other symbol. • Contrast is good.	• The use of a color monitor is required. • Contrast is poor.
1194.22 (d) Readability		

1194.22 Standard	**Compliant**	**Noncompliant**
Documents shall be organized so they are readable without requiring an associated style sheet.	• Style sheets may be used for color, indentation and other presentation effects, but the document is still understandable (even if less visually appealing) when the style sheet is turned off. • Non-HTML web documents (i.e. Portable Document Format (.pdf,) .doc, etc.) are presented in an organized readable format.	• The document is confusing or information is missing when the style sheet is turned off. • Non-HTML web documents are not presented in an organized readable format.
1194.22 (e) Server-Side Image Maps		
Redundant text links shall be provided for each active region of a server-side image map.	• Separate text links are provided outside of the server-side image map to access the same content that the image map hot spots access.	• The only way to access the links of a server-side image map is through the image map hot spots, which usually means that a mouse is required and that the links are unavailable to assistive technologies.
1194.22 (f) Client-Side Image Maps		
Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.	• Standard HTML client-side image maps are used, and appropriate alt text is provided for the image as well as the hot spots	• Server-side image maps are used when a client-side image map would suffice.
1194.22 (g) Simple Data Tables		

1194.22 Standard	Compliant	Noncompliant
Row and column headers shall be identified for data tables.* * This standard does not apply to tables used solely for formatting purposes. Although no standard requires it, a summary attribute should be added to \<table> tags to provide a brief description of the table and an empty summary attribute (summary="") should be used to indicate all formatting tables.	• Data tables have the column and row headers appropriately identified (using the \<th> tag) or using Accessible Rich Internet Applications (ARIA) markup. • Tables used strictly for <u>layout purposes</u> do NOT have header rows or columns.	• Data tables have no header rows or columns. • Tables used for layout use the header attribute when there is no true header.
1194.22 (h) Complex Data Tables		
Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.* * This standard does not apply to tables used solely for formatting purposes. Although no standard requires it, a summary attribute should be added to \<table> tags to provide a brief description of the table and an empty summary attribute (summary="") should be used to indicate all formatting tables.	• Table cells are associated with the appropriate headers (e.g. with the id, headers, scope and/or axis HTML attributes) or using Accessible Rich Internet Applications (ARIA) markup.	• Columns and rows are not associated with column and row headers, or they are associated incorrectly
1194.22 (i) Frames		
Frames shall be titled with text that facilitates frame identification and navigation.	• Each frame is given a title that helps the user understand the frame's purpose	• Frames have no titles, or titles that are not descriptive of the frame's purpose
1194.22 (j) Flicker Rate		

1194.22 Standard	Compliant	Noncompliant
Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.	• No elements on the page flicker at a rate of 2 to 55 cycles per second, thus reducing the risk of optically-induced seizures.	• One or more elements on the page flicker at a rate of 2 to 55 cycles per second, increasing the risk of optically-induced seizures
1194.22 (k) Text-Only Alternative		
A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.	• A text-only version is created only when there is no other way to make the content accessible, or when it offers significant advantages over the "main" version for certain disability types. • The text-only version is up-to-date with the "main" version. • The text-only version provides the functionality equivalent to that of the "main" version. • An alternative is provided for components (e.g. plug-ins, scripts) that are not directly accessible.	• A text-only version is provided only as an excuse not to make the "main" version fully accessible. • The text-only version is not up-to-date with the "main" version. • The text-only version is an unequal, lesser version of the "main" version. • No alternative is provided for components that are not directly accessible.
1194.22 (l) Scripts		
When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.	• Information within the scripts is text-based, or a text alternative is provided within the script itself, in accordance with (a) in these standards. • All scripts (e.g. JavaScript pop-up menus, form elements) are either directly accessible to assistive technologies (keyboard accessibility is a good measure of this), or an alternative method of accessing equivalent functionality is provided (e.g. a standard HTML link).	• Scripts include graphics-as-text with no true text alternative. • Scripts only work with a mouse, and there is no keyboard-accessible alternative either within or outside of the script. • Visible Text is not accessible to assistive technologies
1194.22 (m) Applets and Plug-ins		

1194.22 Standard	Compliant	Noncompliant
When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l).*	• A link is provided to a disability-accessible page where the plug-in can be downloaded. • All Java applets, scripts and plug-ins (including Acrobat PDF files and PowerPoint files, etc.) and the content within them are accessible to assistive technologies, or else an alternative means of accessing equivalent content is provided.	• No link is provided to a page where the plug-in can be downloaded and/or the download page is not disability-accessible. • Plug-ins, scripts and other elements are used indiscriminately, without alternatives for those who cannot access them
1194.22 (n) Electronic Forms		
When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.	• All form controls have text labels adjacent to them. • Form elements have labels associated with them in the markup (i.e. the *id* and *for*, HTML elements). • Dynamic HTML scripting of the form does not interfere with assistive technologies	• Form controls have no labels, or the labels are not adjacent to the controls. • There is no linking of the form element and its label in the HTML. • Dynamic HTML scripting makes parts of the form unavailable to assistive technologies.
1194.22 (o) Navigation Links		
A method shall be provided that permits users to skip repetitive navigation links.	• A link is provided to skip over lists of navigational menus or other lengthy lists of links.	• There is no way to skip over lists of links.
1194.22 (p) Time Delay		
When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.	• The user has control over the timing of content changes.	• The user is required to react quickly, within limited time restraints

6 508 Compliance Testing Guidelines

For development items that require a 508 Compliance assessment, a member of the Quality Assurance (QA) team will perform a 508 Compliance test once development has been completed prior to migration to production. The QA team will document and load tests into Quality Center (QC) for each 1194.21 and 1194.22 standards as documented above, and will utilize the test

when checking for 508 compliance. The QA team member will ensure that each technical specification noted above will be addressed using the assessment criteria noted below:

Table 7. NEACC 508 Assessment Criteria

Assessment	Definition	Action Required
Compliant	Application is compliant for related 1194 technical specification.	No further action required.
Non-Compliant with work-around	Application does not fully meet technical specification, but a work-around solution is available.	Work around solution will be documented and will be approved/disapproved by NASA/ Enterprise Applications Service Technologies (EAST) authority.
Non-Compliant with no work-around	Application does not meet technical specification, and a work-around solution is not available.	Evidence of non-compliance will be documented and will be presented to NASA/EAST authority for disposition.

7   Acceptable 508 Compliance Tools

The following 508 Compliance Tools are acceptable for use by both the developers and testers when performing 508 Compliance validation and testing.

Table 8. NEACC 508 Compliance Tools

Tool	Type	Description & Function Performed
Web Accessibility Evaluation Tool (WAVE)	Code Evaluation	Current version 1.1.18. Evaluates websites for accessibility. http://wave.webaim.org/
Total Validator Pro	Code Evaluation	Current version 7.5.2. Add-on to Firefox to perform web site evaluations. http://www.totalvalidator.com
AccChecker	Code Evaluation	Current version 2.0 for Windows applications http://acccheck.codeplex.com/
Inspect	Code Evaluation	http://msdn.microsoft.com/en-us/library/dd318521%28VS.85%29.aspx Requires installation of the Windows Active Accessibility SDK and works on Windows 7, Vista, and 8

Tool	Type	Description & Function Performed
JAWS	Assistive Technology / Screen Reader	Current version 14.0. Most common screen reader in use today. http://www.freedomscientific.com/products/fs/jaws-product-page.asp

WAVE, Total Validator Pro, AccChecker, and Inspect are the available tools that will be utilized for all code evaluations depending on the code being evaluated, with WAVE being utilized as the primary tool for user accessibility. JAWS will also be utilized as an alternative for LOB teams that wish to test using an "experience-based" approach to get a better understanding of how a Screen Reader will convey information to the user.

8   Records

The following table lists any records/outputs created due to this document.

Table 9. Records

Name of Record	Storage Location	SBU/PII*	Retention Schedule	Responsible Party	Email	Phone No.
None						

* SBU – Sensitive But Unclassified; PII – Personally Identifiable Information

APPENDIX A: POINT OF CONTACT LIST

Table 10. Points of Contact

Name	Position	Center	Phone Number
▮▮▮▮▮	NEACC 508 Compliance Coordinator– NASA Document Owner	MSFC – NEACC	▮▮▮▮▮